FIG. 1

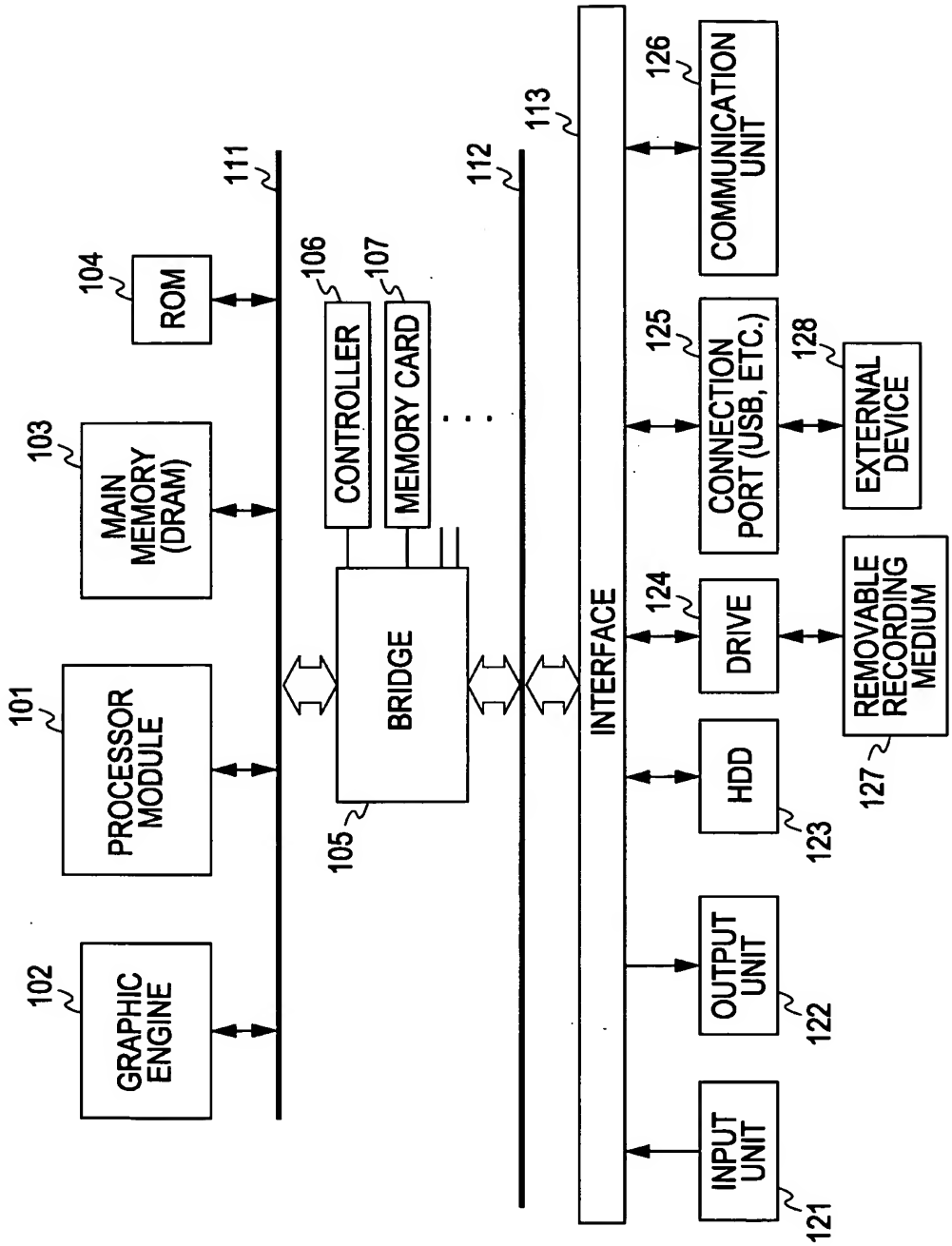

101
PROCESSOR MODULE
102
GRAPHIC ENGINE
103
MAIN MEMORY (DRAM)
104
ROM
105
BRIDGE
106
CONTROLLER
107
MEMORY CARD
111
112
113
INTERFACE
121
INPUT UNIT
122
OUTPUT UNIT
123
HDD
124
DRIVE
125
CONNECTION PORT (USB, ETC.)
126
COMMUNICATION UNIT
127
REMOVABLE RECORDING MEDIUM
128
EXTERNAL DEVICE

FIG. 2

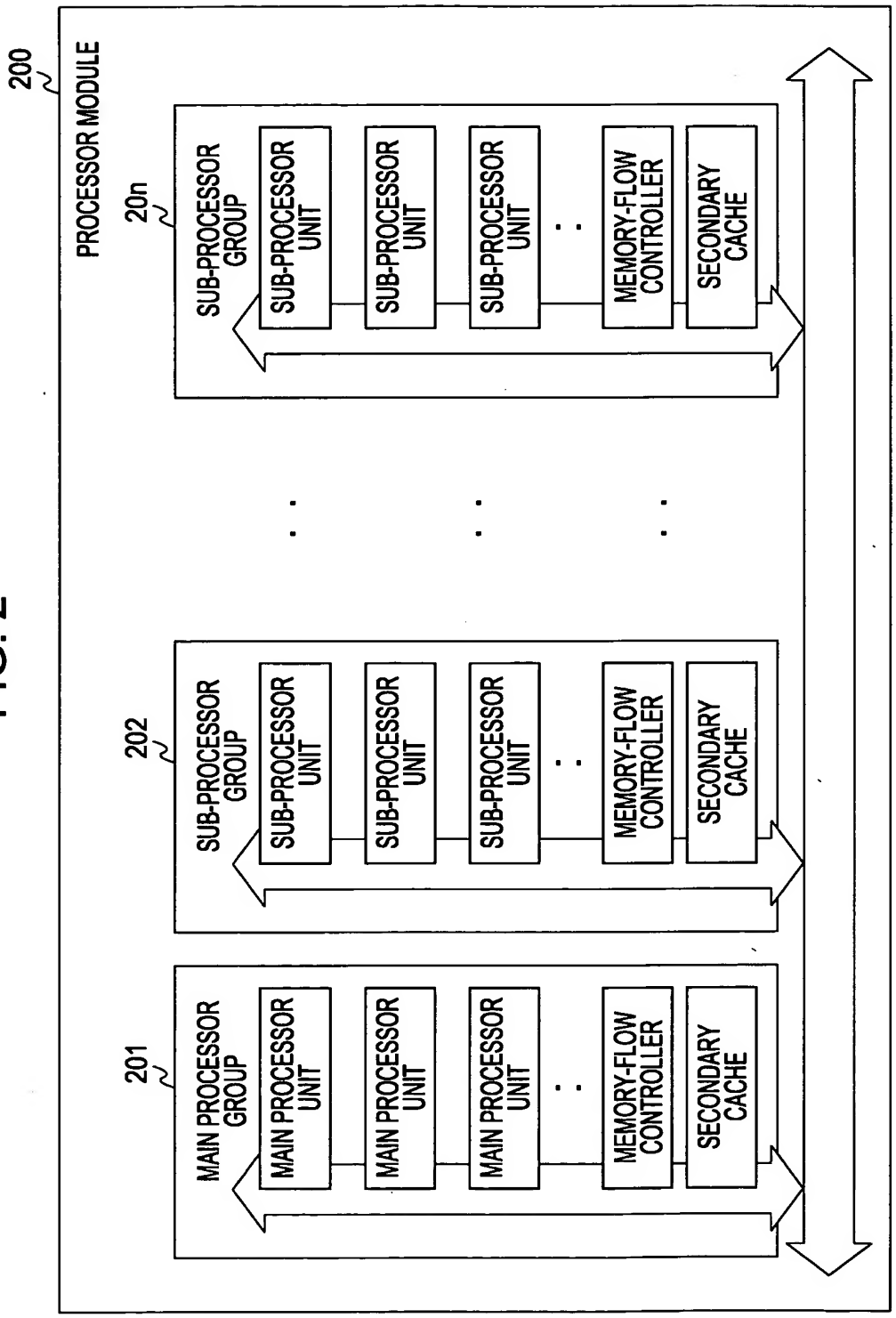

200
PROCESSOR MODULE
201
MAIN PROCESSOR GROUP
MAIN PROCESSOR UNIT
MAIN PROCESSOR UNIT
MAIN PROCESSOR UNIT
MEMORY-FLOW CONTROLLER
SECONDARY CACHE
202
SUB-PROCESSOR GROUP
SUB-PROCESSOR UNIT
SUB-PROCESSOR UNIT
SUB-PROCESSOR UNIT
MEMORY-FLOW CONTROLLER
SECONDARY CACHE
20n
SUB-PROCESSOR GROUP
SUB-PROCESSOR UNIT
SUB-PROCESSOR UNIT
SUB-PROCESSOR UNIT
MEMORY-FLOW CONTROLLER
SECONDARY CACHE

FIG. 3

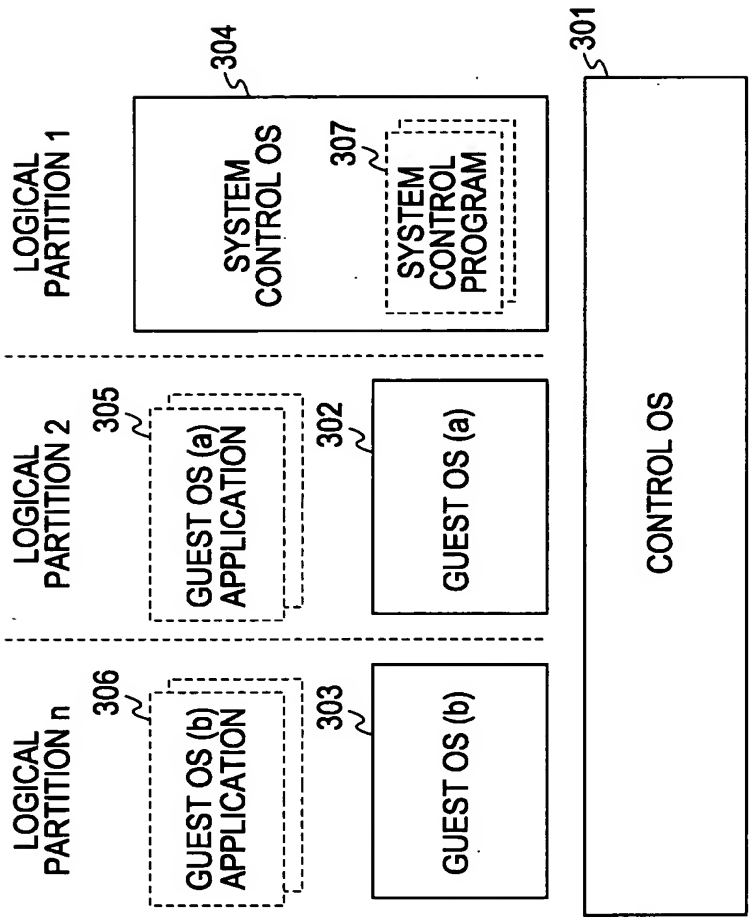

LOGICAL PARTITION 1
LOGICAL PARTITION 2
LOGICAL PARTITION n
SYSTEM CONTROL OS
304
SYSTEM CONTROL PROGRAM
307
GUEST OS (a)
302
GUEST OS (a) APPLICATION
305
GUEST OS (b)
303
GUEST OS (b) APPLICATION
306
CONTROL OS
301

FIG. 4

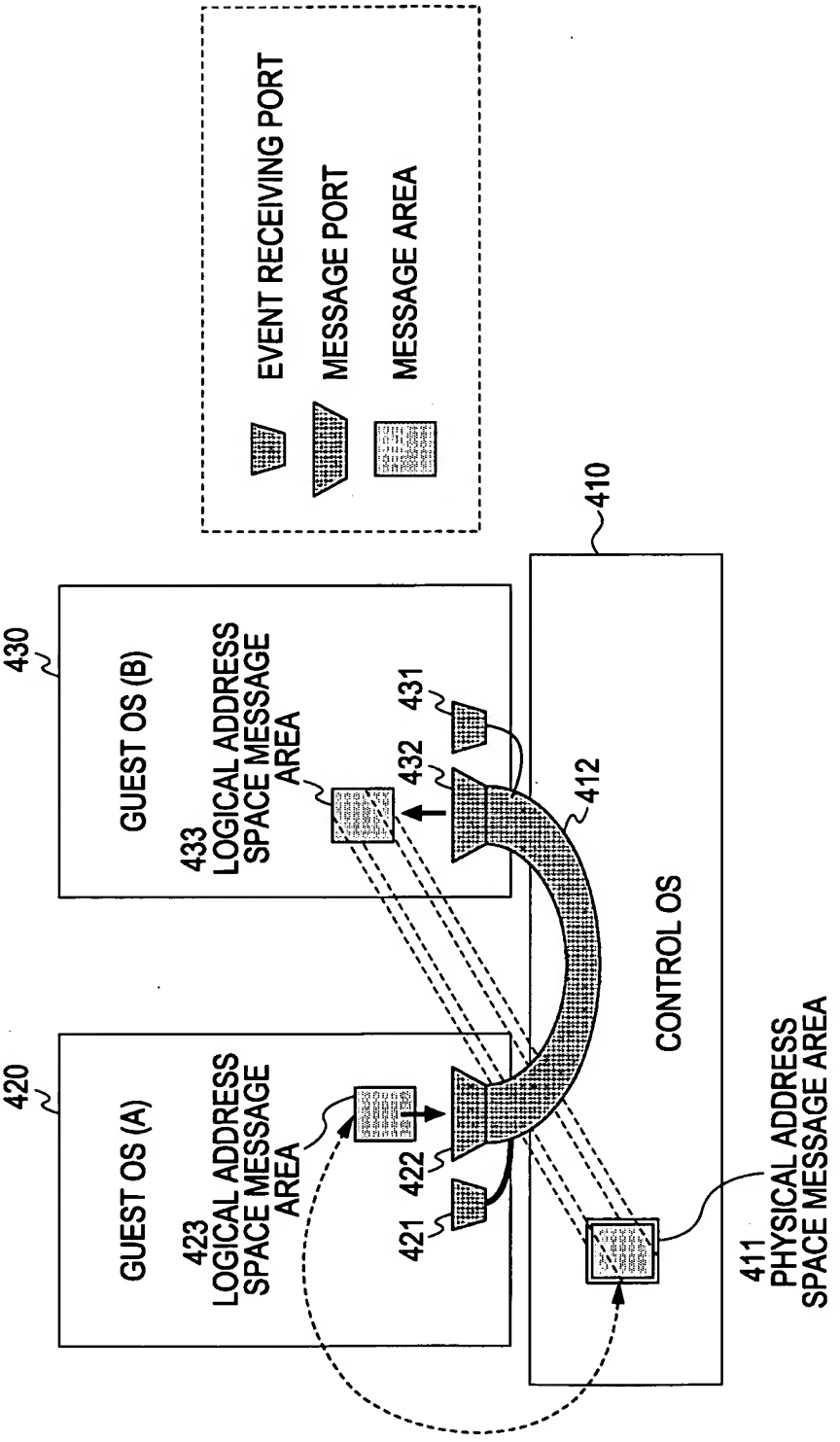

EVENT RECEIVING PORT
MESSAGE PORT
MESSAGE AREA
410
CONTROL OS
411
PHYSICAL ADDRESS
SPACE MESSAGE AREA
412
420
GUEST OS (A)
423
LOGICAL ADDRESS
SPACE MESSAGE
AREA
421
422
430
GUEST OS (B)
433
LOGICAL ADDRESS
SPACE MESSAGE
AREA
431
432

FIG. 5

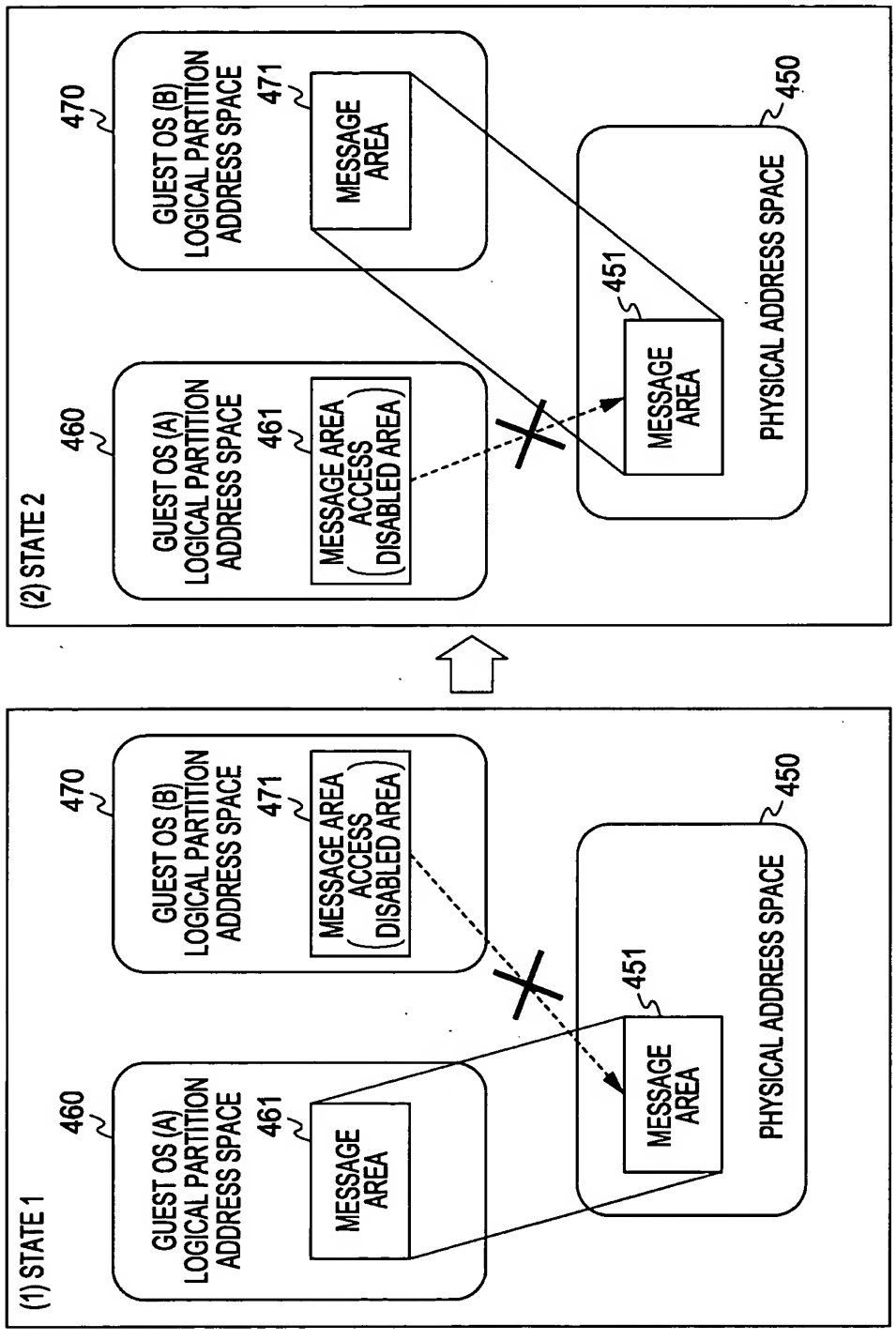

(1) STATE 1
460
GUEST OS (A)
LOGICAL PARTITION
ADDRESS SPACE
461
MESSAGE
AREA
470
GUEST OS (B)
LOGICAL PARTITION
ADDRESS SPACE
471
MESSAGE AREA
ACCESS
DISABLED AREA
451
MESSAGE
AREA
450
PHYSICAL ADDRESS SPACE
(2) STATE 2
460
GUEST OS (A)
LOGICAL PARTITION
ADDRESS SPACE
461
MESSAGE AREA
ACCESS
DISABLED AREA
470
GUEST OS (B)
LOGICAL PARTITION
ADDRESS SPACE
471
MESSAGE
AREA
451
MESSAGE
AREA
450
PHYSICAL ADDRESS SPACE

FIG. 6

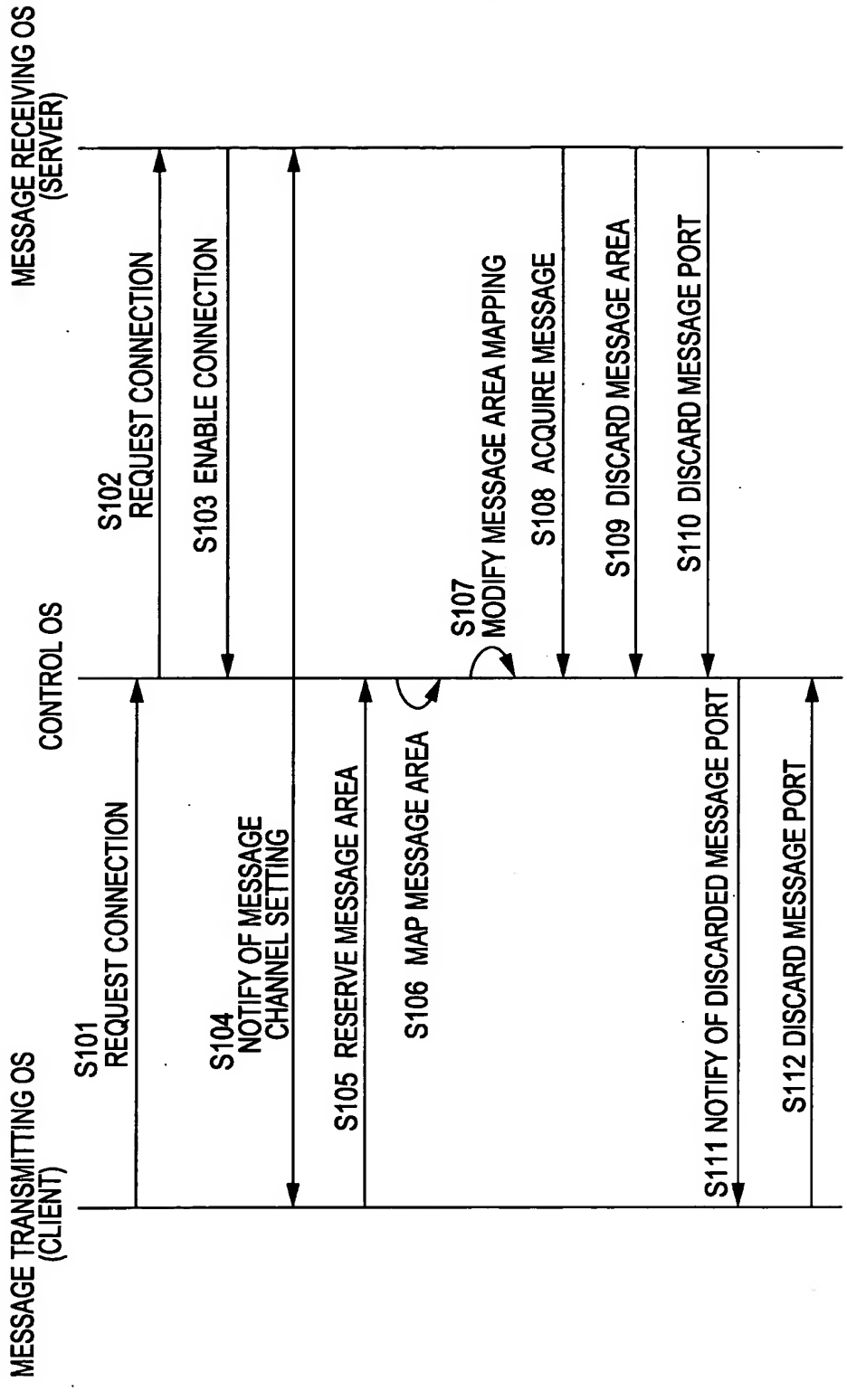

MESSAGE TRANSMITTING OS (CLIENT)
CONTROL OS
MESSAGE RECEIVING OS (SERVER)
S101 REQUEST CONNECTION
S102 REQUEST CONNECTION
S103 ENABLE CONNECTION
S104 NOTIFY OF MESSAGE CHANNEL SETTING
S105 RESERVE MESSAGE AREA
S106 MAP MESSAGE AREA
S107 MODIFY MESSAGE AREA MAPPING
S108 ACQUIRE MESSAGE
S109 DISCARD MESSAGE AREA
S110 DISCARD MESSAGE PORT
S111 NOTIFY OF DISCARDED MESSAGE PORT
S112 DISCARD MESSAGE PORT

FIG. 7

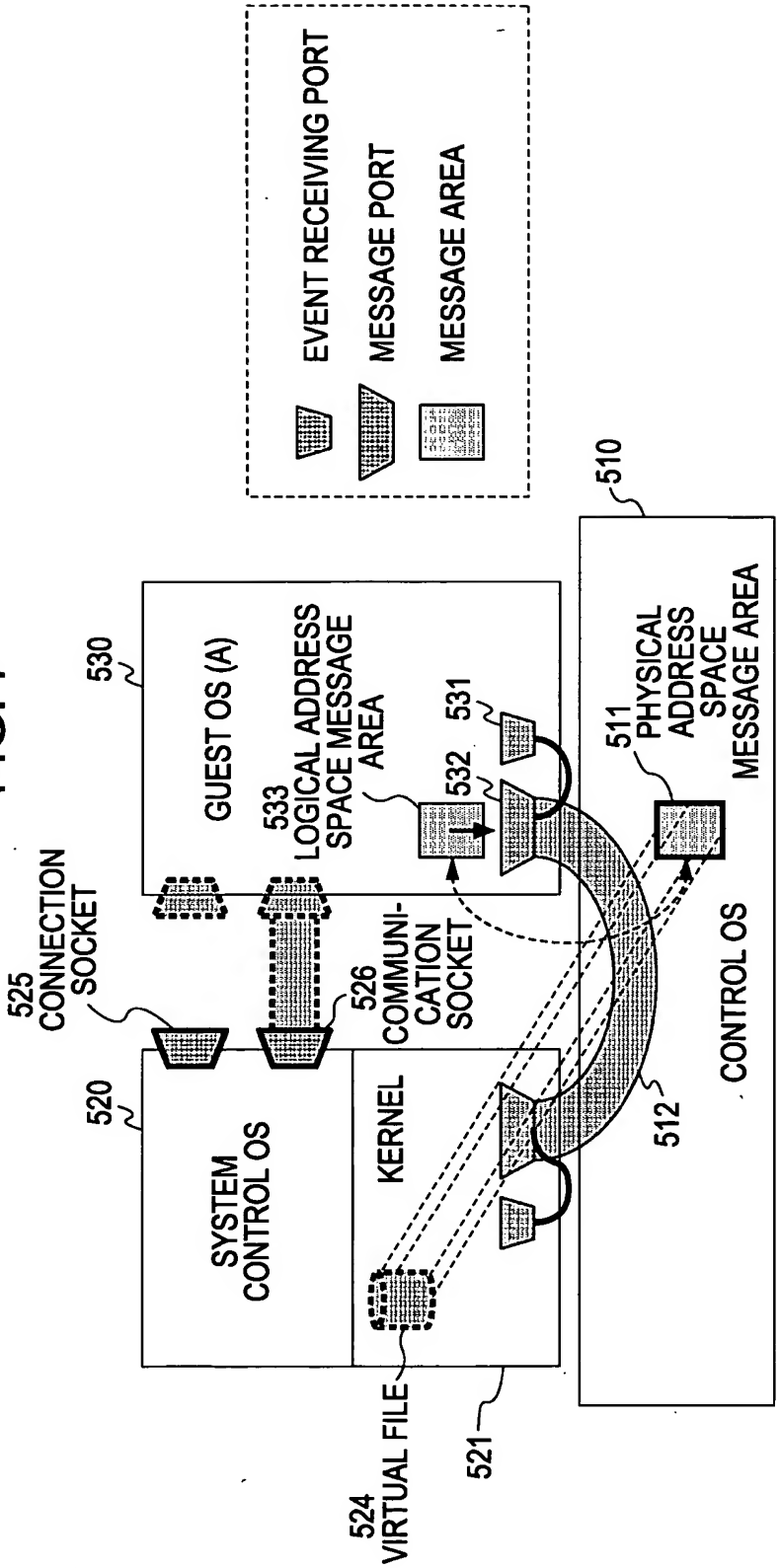

EVENT RECEIVING PORT
MESSAGE PORT
MESSAGE AREA
510
530
GUEST OS (A)
533
LOGICAL ADDRESS SPACE MESSAGE AREA
531
532
511
PHYSICAL ADDRESS SPACE MESSAGE AREA
525
CONNECTION SOCKET
526
COMMUNI-CATION SOCKET
520
SYSTEM CONTROL OS
KERNEL
512
CONTROL OS
524
VIRTUAL FILE
521

FIG. 8

	PROCESS OF SYSTEM CONTROL PROGRAM	PROCESS IN CORRESPONDING KERNEL (MESSAGE CHANNEL INTERFACE)
S201	socket = socket (...)	PRODUCE SOCKET AND PREPARE FOR RECEPTION OF CONNECTION REQUEST OF MESSAGE CHANNEL
S202	bind (socket, ...)	BIND SOCKET TO SERVICE ID FOR SYSTEM CONTROL PROGRAM TO WAIT FOR CONNECTION REQUEST
S203	listen (socket, ...)	ENABLE CONNECTION TO SPECIFIED SERVICE
S204	fd = accept (socket, ...)	CONNECT MESSAGE CHANNEL
S-A (a)	read (fd, ...)	ACQUIRE FILE NAME BY RECEIVING MESSAGE
S-B (a)	open/close/read/write message file	READ AND WRITE CONTENT OF MESSAGE
S-C (a)	write (fd, ...	TRANSFER SPECIFIED MESSAGE
S-D (a)	unlink () message	DISCARD RECEIVED MESSAGE
S-E	close (socket)	DELETE MESSAGE PORT AND DISCONNECT MESSAGE CHANNEL

FIG. 9

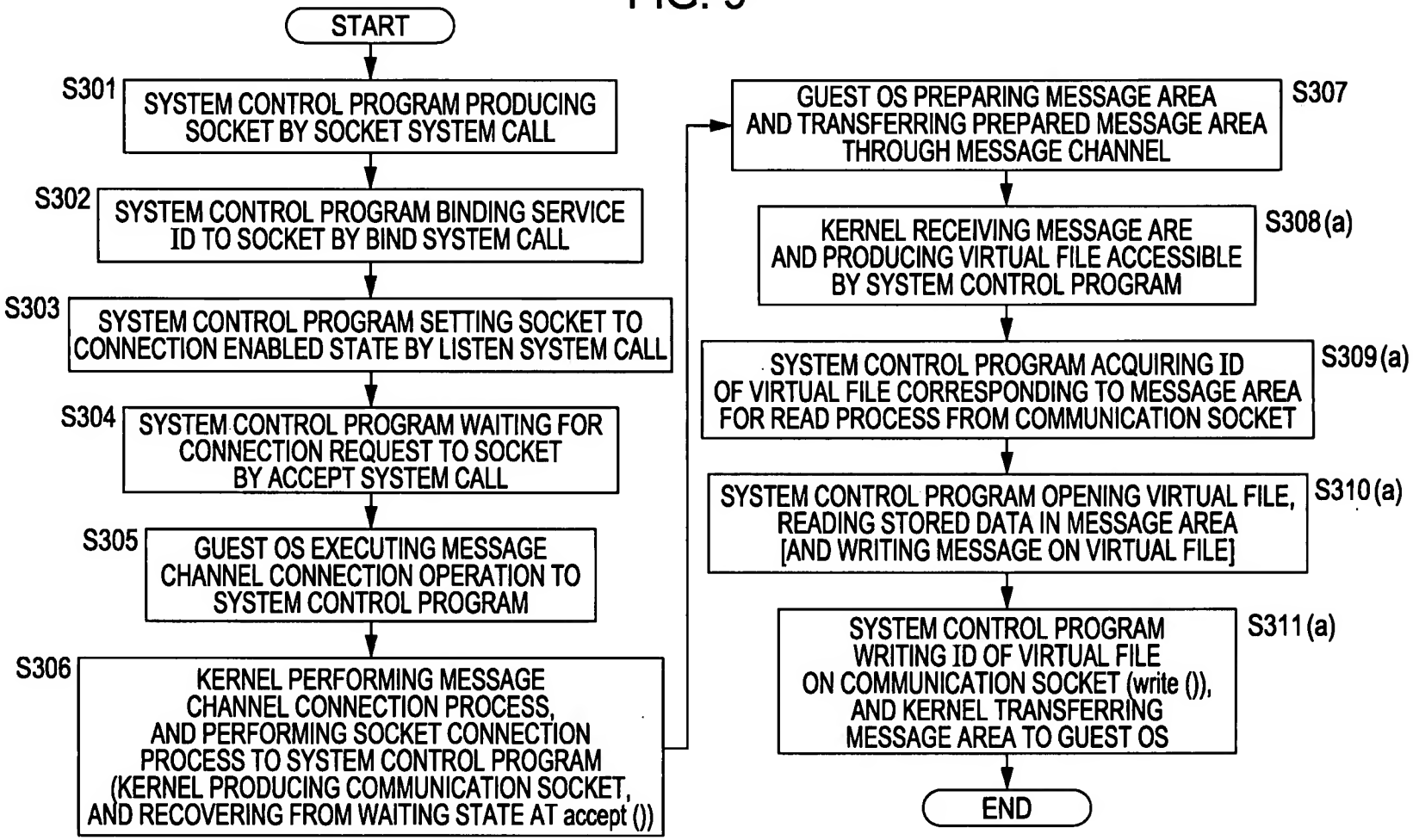

START
S301
SYSTEM CONTROL PROGRAM PRODUCING SOCKET BY SOCKET SYSTEM CALL
S302
SYSTEM CONTROL PROGRAM BINDING SERVICE ID TO SOCKET BY BIND SYSTEM CALL
S303
SYSTEM CONTROL PROGRAM SETTING SOCKET TO CONNECTION ENABLED STATE BY LISTEN SYSTEM CALL
S304
SYSTEM CONTROL PROGRAM WAITING FOR CONNECTION REQUEST TO SOCKET BY ACCEPT SYSTEM CALL
S305
GUEST OS EXECUTING MESSAGE CHANNEL CONNECTION OPERATION TO SYSTEM CONTROL PROGRAM
S306
KERNEL PERFORMING MESSAGE CHANNEL CONNECTION PROCESS, AND PERFORMING SOCKET CONNECTION PROCESS TO SYSTEM CONTROL PROGRAM (KERNEL PRODUCING COMMUNICATION SOCKET, AND RECOVERING FROM WAITING STATE AT accept ())
S307
GUEST OS PREPARING MESSAGE AREA AND TRANSFERRING PREPARED MESSAGE AREA THROUGH MESSAGE CHANNEL
S308(a)
KERNEL RECEIVING MESSAGE ARE AND PRODUCING VIRTUAL FILE ACCESSIBLE BY SYSTEM CONTROL PROGRAM
S309(a)
SYSTEM CONTROL PROGRAM ACQUIRING ID OF VIRTUAL FILE CORRESPONDING TO MESSAGE AREA FOR READ PROCESS FROM COMMUNICATION SOCKET
S310(a)
SYSTEM CONTROL PROGRAM OPENING VIRTUAL FILE, READING STORED DATA IN MESSAGE AREA [AND WRITING MESSAGE ON VIRTUAL FILE]
S311(a)
SYSTEM CONTROL PROGRAM WRITING ID OF VIRTUAL FILE ON COMMUNICATION SOCKET (write ()), AND KERNEL TRANSFERRING MESSAGE AREA TO GUEST OS
END

FIG. 10

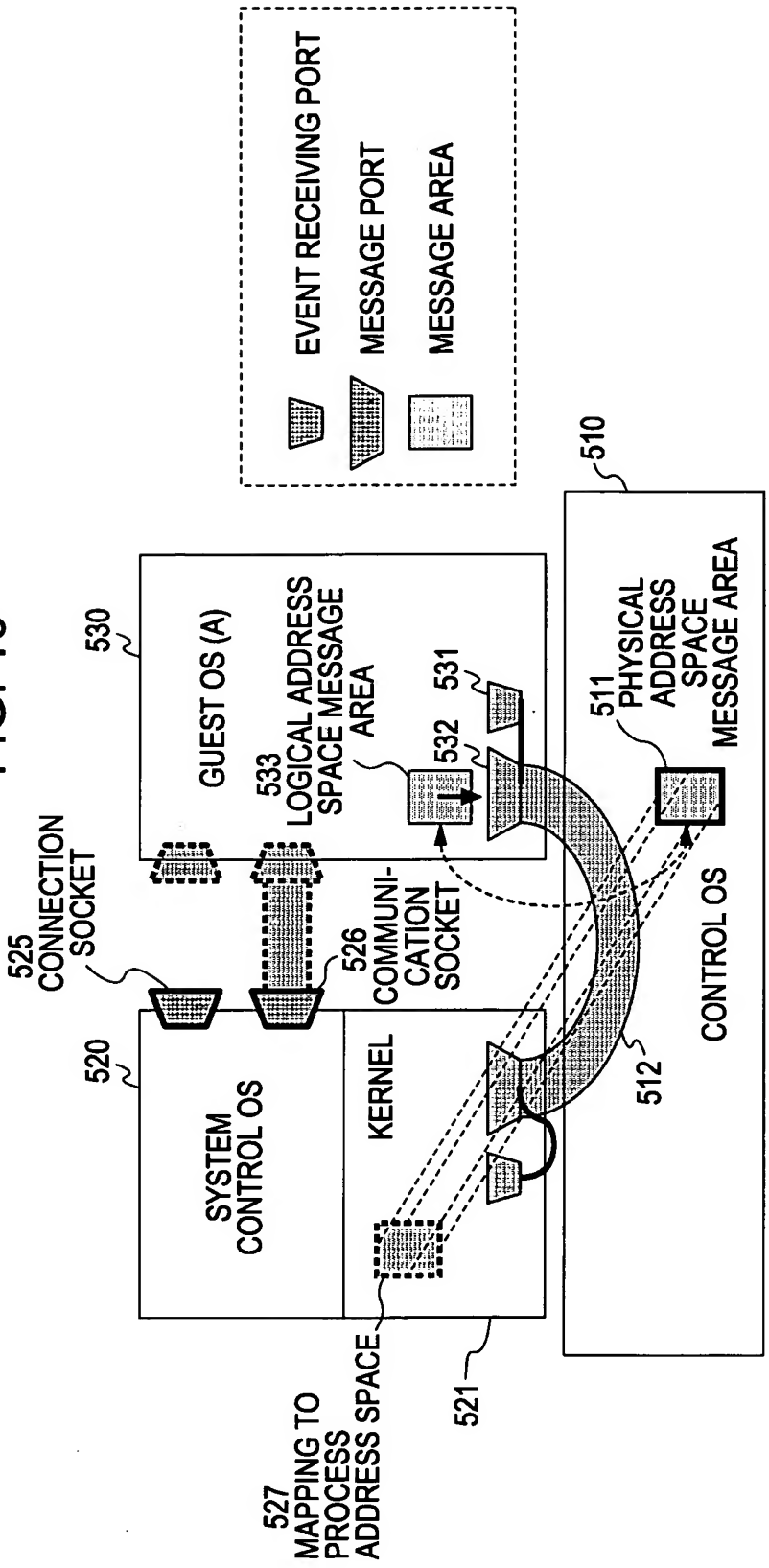
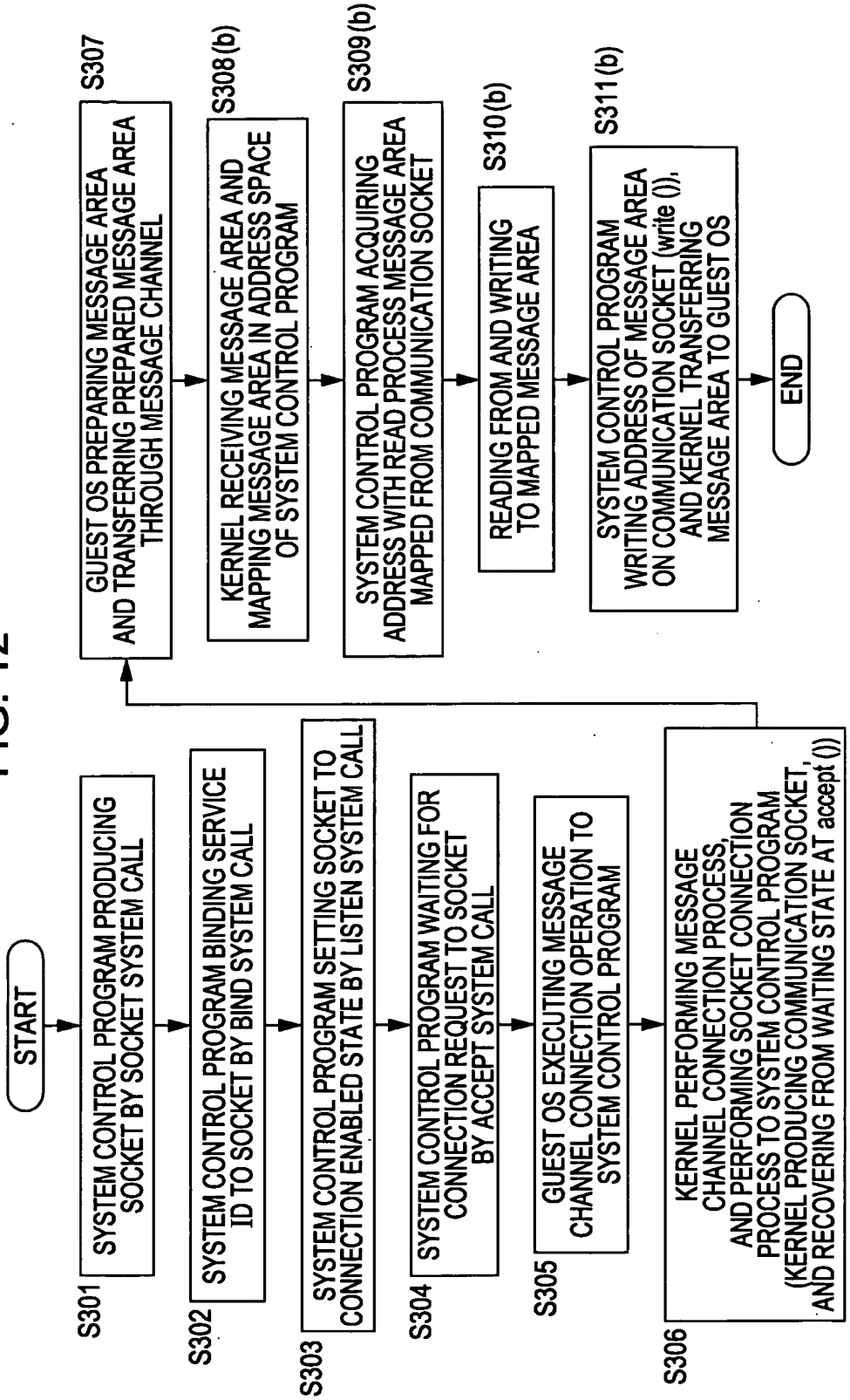

EVENT RECEIVING PORT
MESSAGE PORT
MESSAGE AREA
510
530
GUEST OS (A)
533
LOGICAL ADDRESS SPACE MESSAGE AREA
531
532
511
PHYSICAL ADDRESS SPACE MESSAGE AREA
525
CONNECTION SOCKET
526
COMMUNI-CATION SOCKET
520
SYSTEM CONTROL OS
KERNEL
512
CONTROL OS
527
MAPPING TO PROCESS ADDRESS SPACE
521

FIG. 11

	PROCESS OF SYSTEM CONTROL PROGRAM	PROCESS IN CORRESPONDING KERNEL (MESSAGE CHANNEL INTERFACE)
S201	socket = socket (...)	PRODUCE SOCKET AND PREPARE FOR RECEPTION OF CONNECTION REQUEST OF MESSAGE CHANNEL
S202	bind (socket, ...)	BIND SOCKET TO SERVICE ID FOR SYSTEM CONTROL PROGRAM TO WAIT FOR CONNECTION REQUEST
S203	listen (socket, ...)	ENABLE CONNECTION TO SPECIFIED SERVICE
S204	fd = accept (socket, ...)	CONNECT MESSAGE CHANNEL
S-A (b)	read (fd, ...)	ACQUIRE ADDRESS (MAPPED IN PROCESS ADDRESS SPACE) BY RECEIVING MESSAGE
S-B (b)	access to message	READ AND WRITE DIRECTLY CONTENT OF MESSAGE
S-C (b)	write (fd, ...	TRANSFER SPECIFIED MESSAGE
S-D (b)	open message area	RELEASE MAPPING OF PROCESS TO ADDRESS SPACE
S-E	close (socket)	DELETE MESSAGE PORT AND DISCONNECT MESSAGE CHANNEL

FIG. 12


START
S301
SYSTEM CONTROL PROGRAM PRODUCING SOCKET BY SOCKET SYSTEM CALL
S302
SYSTEM CONTROL PROGRAM BINDING SERVICE ID TO SOCKET BY BIND SYSTEM CALL
S303
SYSTEM CONTROL PROGRAM SETTING SOCKET TO CONNECTION ENABLED STATE BY LISTEN SYSTEM CALL
S304
SYSTEM CONTROL PROGRAM WAITING FOR CONNECTION REQUEST TO SOCKET BY ACCEPT SYSTEM CALL
S305
GUEST OS EXECUTING MESSAGE CHANNEL CONNECTION OPERATION TO SYSTEM CONTROL PROGRAM
S306
KERNEL PERFORMING MESSAGE CHANNEL CONNECTION PROCESS, AND PERFORMING SOCKET CONNECTION PROCESS TO SYSTEM CONTROL PROGRAM (KERNEL PRODUCING COMMUNICATION SOCKET, AND RECOVERING FROM WAITING STATE AT accept ())
S307
GUEST OS PREPARING MESSAGE AREA AND TRANSFERRING PREPARED MESSAGE AREA THROUGH MESSAGE CHANNEL
S308(b)
KERNEL RECEIVING MESSAGE AREA AND MAPPING MESSAGE AREA IN ADDRESS SPACE OF SYSTEM CONTROL PROGRAM
S309(b)
SYSTEM CONTROL PROGRAM ACQUIRING ADDRESS WITH READ PROCESS MESSAGE AREA MAPPED FROM COMMUNICATION SOCKET
S310(b)
READING FROM AND WRITING TO MAPPED MESSAGE AREA
S311(b)
SYSTEM CONTROL PROGRAM WRITING ADDRESS OF MESSAGE AREA ON COMMUNICATION SOCKET (write ()), AND KERNEL TRANSFERRING MESSAGE AREA TO GUEST OS
END